AVENAR detector 4000

BOSCH
Invented for life

- Highly reliable and accurate thanks to Intelligent Signal Processing (ISP)
- Earliest detection of lightest smoke with dual-optical versions (Dual-Ray technology)
- Monitors environment for electromagnetic influence for fast root-cause analysis
- Automatic and manual address setting

AVENAR detector 4000 is a new range of automatic fire detectors featuring a superb accuracy and swiftness in detection. The versions with two optical sensors (dual-optical) are able to detect the lightest smoke. The range includes versions with rotaries, manually and automatically addressable, and versions without rotaries for automatic address setting.

Functions

Sensor technology and signal processing
The individual sensors can be configured in the FSP-5000-RPS programming software.
All sensor signals are analysed continuously by the internal evaluation electronics (ISP - Intelligent Signal Processing) and are linked with each other via an inbuilt microprocessor. The link between the sensors means that the combined detectors can also be used where light smoke, steam or dust must be expected during the course of normal operation.
Only if the signal combination corresponds to the characteristics of the application site, selected during the programming, the alarm is triggered automatically. This results in less false alarms.
In addition, the time of the sensor signals on fire and fault detection is analysed, which leads to high detection reliability for each individual sensor.

In the case of the optical and chemical sensor, the response threshold (drift compensation) is actively adjusted. Manual or time-controlled switch-off of individual sensors is possible for adjustment to extreme interference factors.

Optical sensor (smoke sensor)
The optical sensor uses the scattered-light method. An LED transmits light to the measuring chamber, where it is absorbed by the labyrinth structure. In the event of a fire, smoke enters the measuring chamber and the smoke particles scatter the light from the LED. The amount of light hitting the photo diode is converted into a proportional electrical signal.
The dual-optical versions use two optical sensors with different wavelengths. The Dual-Ray technology works with an infrared and a blue LED so that lightest smoke is detected fast and reliably (TF1 and TF9 detection).

Thermal sensor (temperature sensor)
A thermistor in a resistance network is used as a thermal sensor from which an analog-digital converter measures the temperature-dependent voltage at regular intervals.
Depending on the specified detector class, the temperature sensor triggers the alarm status when the maximum temperature of 54 °C or 69 °C is exceeded

(thermal maximum), or if the temperature rises by a defined amount within a specified time (thermal differential).

Chemical sensor (CO gas sensor)
The main function of the gas sensor is to detect carbon monoxide (CO) generated as a result of a fire, but it will also detect hydrogen (H) and nitrous monoxide (NO). The sensor signal value is proportional to the concentration of gas. The gas sensor delivers additional information to effectively suppress deceptive values.
Since the service life of the gas sensor is limited, the C sensor shuts down automatically after a maximum of 6 years of operation. The detector will then still operate as a multi-sensor detector with dual-optical and thermal sensor. It is recommended to exchange the detector immediately in order to keep the higher detection reliability of the version with C sensor.

Improved LSN features
AVENAR detector 4000 offers all the features of the improved LSN technology:
- Flexible network structures, including T-tapping without additional elements (no T-tapping feasible for versions without rotaries)
- Up to 254 LSN improved elements per loop or stub line
- Automatic or manual detector addressing, with or without auto-detection
- Power supply for connected elements via LSN bus
- Unshielded fire detection cable can be used
- Cable length up to 3000 m (with LSN 1500 A)
- Backwards compatibility to existing LSN systems and central units
- Monitoring of environmental electromagnetic impact for fast root-cause analysis (EMC values are displayed on the panel)

In addition, the range offers all the established benefits of LSN technology. The panel programming software can be used to change the detection characteristics of the respective room utilization. Each configured detector can provide the following data:
- Serial number
- Contamination level of the optical section
- Operating hours
- Current analog values
  - Optical system values: current measured value of the scattered light sensor; the measuring range is linear and shows different degrees of pollution, from slight to heavy.
  - Contamination: the contamination value shows how much the current contamination value has increased relative to the original condition.
  - CO value: display of the currently measured value.

The sensor is self-monitoring. The following errors are indicated on the fire panel:
- Fault indication in the event of the failure of the detector electronics
- Continuous display of contamination level during service
- Fault indication if heavy contamination is detected (instead of triggering a false alarm)

In the event of wire interruption or short-circuit, integrated isolators maintain the functional security of the LSN loop.
In the event of an alarm, individual detector identification is transmitted to the fire panel.

Further characteristics
- A red flashing LED visible 360° indicates the alarm.
- Connection to a remote indicator is possible.
- The strain relief for cables in false ceilings prevents the cables from being unplugged accidentally from the terminals after installation. The terminals for cable cross-sections up to 2.5 mm^2 are very easily accessible.
- The detectors have a dust-repellent labyrinth and cap construction. The chamber maid plug (an opening with closing plug) on the bottom is used to clean the optical chamber with compressed air (not required for the heat detector).
- The detector bases no longer have to be directed due to the centralized position of the individual display. They also have a mechanical removal lock (can be activated and deactivated).

Certifications and approvals

Region	Regulatory compliance/quality marks	
Europe	CPR	0786-CPR-21402 FAH-425-T-R
	CPR	0786-CPR-21403 FAP-425-DO-R
	CPR	0786-CPR-21405 FAP-425-DOTC-R
	CPR	0786-CPR-21404 FAP-425-DOT-R
	CPR	0786-CPR-21398 FAP-425-O
	CPR	0786-CPR-21399 FAP-425-O-R
	CPR	0786-CPR-21400 FAP-425-OT
	CPR	0786-CPR-21401 FAP-425-OT-R
Germany	VdS	G214100 FAP-425-O
	VdS	G214099 FAP-425-O-R
	VdS	G214098 FAP-425-OT
	VdS	G214097 FAP-425-OT-R
	VdS	G214101 FAH-425-T-R
	VdS	G214104 FAP-425-DO-R
	VdS	G214103 FAP-425-DOT-R
	VdS	G214102 FAP-425-DOTC-R
Europe	CE	FAP/FAH/FAD-425
	CE	FAP-425

Installation/configuration notes

- Connectable to Bosch fire panels with the improved LSN system parameters.

- You can use the DO detectors only with the Panel Controller MPC version B and higher. The Panel Controller MPC version A cannot be connected.
- In LSN classic mode connectable to the LSN fire panels BZ 500 LSN, UEZ 2000 LSN, UGM 2020 and to other panels or their receiver modules with identical connection conditions, although with the previous LSN system parameters
- During planning works, it is essential to adhere to national standards and guidelines.
- The detector can be painted (cap and base) and thereby adapted to the surrounding colour scheme. Note the information in the Painting Instructions.
- Detectors of the 420 series can be replaced by all versions of the AVENAR detector 4000 without re-configuring the panel.

Installation/configuration notes in accordance with VdS/VDE

- The FAP-425-DOTC-R, FAP-425-DOT-R, FAP-425-OT-R, and FAP-425-OT versions are planned in accordance with the guidelines for optical detectors if operated as optical detectors or as combined optical/thermal detectors (see DIN VDE 0833 Part 2 and VDS 2095)
- If occasional deactivation of the optical unit (scattered light sensor) is required, planning must be based on the guidelines for heat detectors (see DIN VDE 0833 Part 2 and VDS 2095)
- When planning fire barriers according to DIBt, note that the heat detector (FAH-425-T-R) must be configured in accordance with class A1R.

Technical specifications

Electrical

Operating voltage	15 V DC to 33 V DC
Current consumption	< 0.55 mA
Alarm output	Per data word by two-wire signal line
Indicator output	Open collector connects 0 V over 1.5 kΩ through, max. 15 mA

Mechanics

Dimensions	
• Without base	Ø 99.5 x 52 mm
• With base	Ø 120 x 63.5 mm
Housing	
• Material	Plastic, ABS (Novodur)
• Color	White, similar to RAL 9010, matt finish
Weight	Without / With packaging
• FAP-425-DOTC-R	Approx. 85 g / Approx. 130 g
• FAP-425-DO-R, FAP-425-DOT-R	Approx. 80 g / Approx. 120 g
• FAP-425-O-R, FAP-425-OT-R, FAH-425-T-R	Approx. 80 g / Approx. 120 g
• FAP-425-O, FAP-425-OT	Approx. 75 g / Approx. 115 g

Environmental conditions

Permissible operating temperature	
• FAP-425-DOTC-R	-10°C to +50°C
• FAP-425-DOT-R, FAP-425-OT-R, FAH-425-T-R, FAP-425-OT	-20°C to +50°C
• FAP-425-DO-R, FAP-425-O-R, FAP-425-O	-20°C to +65°C
Permissible storage temperature	
• FAP-425-DOTC-R	-20°C to +50 °C
• All versions (except for FAP-425-DOTC-R)	-25°C to +80°C
Permissible relative humidity	95% (non-condensing)
Permissible air speed	20 m/s.
Degree of protection (IEC 60529)	IP41 , IP43 with detector base and FAA-420-SEAL or MSC 420

Further characteristics

Response sensitivity	
• Optical part	In accordance with EN 54-7 (programmable)
• Thermal maximum part	> 54°C / > 69°C
• Thermal differential part: • FAH-425-T-R	A2S / A2R / A1 / A1R / BS / BR, in line with EN 54-5 (programmable)
• Thermal differential part: • FAP-425-DOTC-R, FAP-425-DOT-R, FAP-425-OT-R, FAP-425-OT	A2S / A2R / BS / BR, in line with EN 54-5 (programmable)
• Gas sensor	In ppm range
Individual display	LED red and green
Color code	
• FAP-425-O-R, FAP-425-O	No marking

• FAP-425-OT-R, FAP-425-OT	Black loop
• FAH-425-T-R	Red loop
• FAP-425-DO-R	2 gray concentric loops
• FAP-425-DOT-R	2 black concentric loops
• FAP-425-DOTC-R	2 yellow concentric loops

Limits
Heed local guidelines. They overrule the following limits.

Monitoring area	
• All versions (except for FAH-425-T-R)	Max. 120 m^2
• FAH-425-T-R	Max. 40 m^2
Maximum installation height	
• All versions (except for FAH-425-T-R)	Max. 16 m
• FAH-425-T-R	Max. 7.5 m

Ordering information

FAP-425-O-R Smoke detector, optical
Analog addressable detector with one optical sensor, manually and automatically addressable.
Order number **FAP-425-O-R**

FAP-425-OT-R Multisensor detector, optical/thermal
Analog addressable detector with one optical and one thermal sensor, manually and automatically addressable.
Order number **FAP-425-OT-R**

FAH-425-T-R Heat detector
Analog addressable heat detector with one thermal sensor, manually and automatically addressable.
Order number **FAH-425-T-R**

FAP-425-DO-R Smoke detector, dual-optical
Analog addressable detector with two optical sensors, manually and automatically addressable.
Order number **FAP-425-DO-R**

FAP-425-DOT-R Multisensor detector, dual-optic/thermal
Analog addressable detector with two optical sensors and one thermal sensor, manually and automatically addressable.
Order number **FAP-425-DOT-R**

FAP-425-DOTC-R Detector dual-optical/thermal/chemical
Analog addressable detector with two optical sensors, one thermal and one chemical sensor, manually and automatically addressable.
Order number **FAP-425-DOTC-R**

FAP-425-O Smoke detector, optical auto-addressable
Analog addressable detector with one optical sensor, automatic address setting.
Order number **FAP-425-O**

FAP-425-OT Detector optic/thermal auto-addressable
Analog addressable detector with one optical and one thermal sensor, automatic address setting.
Order number **FAP-425-OT**

Accessories

MS 400 B Detector base with Bosch logo
Bosch-branded detector base for surface mounted and flush-mounted cable feed
Order number **MS 400 B**

MS 400 Detector base
Detector base for surface mounted and flush-mounted cable feed, not branded.
Order number **MS 400**

FAA-420-SEAL Damp room seal, 10 pcs
Damp room seal
Delivery unit is 10.
Order number **FAA-420-SEAL**

MSC 420 Base extension with damp room sealing
Extension for detector bases with surface-mounted cable feed
Order number **MSC 420**

MS 420 Base with spring
With integrated jumper elements for checking the proper wiring during installation.
Order number **MS 420**

FAA-MSR420 Detector base with relay
with a change-over relay (Form C)
Order number **FAA-MSR420**

FNM-420-A-BS-WH Base sounder indoor, white
analog addressable base sounder for indoor use, white
Order number **FNM-420-A-BS-WH**

FNM-420-A-BS-RD Base sounder indoor, red
analog addressable base sounder for indoor use, red
Order number **FNM-420-A-BS-RD**

FNM-420U-A-BSWH Base sounder uninterruptible, white
uninterruptible analog addressable base sounder for indoor use, white, delivered without cover
Order number **FNM-420U-A-BSWH**

FNM-420U-A-BSRD Base sounder uninterruptible indoor, red
uninterruptible analog addressable base sounder for indoor use, red
Order number **FNM-420U-A-BSRD**

FAA-420-RI-DIN Remote indicator for DIN application
For applications where the automatic detector is not visible, or mounted in false ceilings/floors.
This version complies with DIN 14623.
Order number **FAA-420-RI-DIN**

FAA-420-RI-ROW Remote indicator
For applications where the automatic detector is not visible, or mounted in false ceilings/floors.
Order number **FAA-420-RI-ROW**

WA400 Wall bracket
Console for DIBt compliant mounting of detectors above doors etc., including detector base
Order number **WA400**

MH 400 Heating element
usable at locations where the functional safety of the detector might be impaired by condensation
Order number **MH 400**

FMX-DET-MB Mounting bracket
Mounting bracket for installation in false floors
Order number **FMX-DET-MB**

SK 400 Protective cage
prevents damage
Order number **SK 400**

SSK400 Dust protection, 10pcs
Protective dust cover for automatic point type detectors.
Delivery unit is 10.
Order number **SSK400**

TP4 400 Label plate small
Support plate for detector identification.
Delivery unit is 50.
Order number **TP4 400**

TP8 400 Label plate large
Support plate for detector identification, large.
Delivery unit is 50.
Order number **TP8 400**

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13655921419 | en, V17, 12. Dec 2018